Site Selection for Tree Planting within a SIP

What is this factsheet about?

- This factsheet examines the problem of estimating the quantity and establishing the location of planting sites for a large tree-planting program
- It is one of a series of short factsheets written to aid anyone considering the possibility of integrating tree planting into a SIP

Why does it matter?

- Large tree-planting programs need to locate significant numbers of suitable sites in a timely, accurate and cost-effective manner
- Site availability is the most important factor affecting the degree to which tree planting can be incorporated into a SIP
- Having "the right tree in the right place" is critical to tree survival, growth and health

How should site selection be approached?

- Estimate available planting space in the target area
- Locate that space
- Prioritize space to maximize return on invested cost and effort
- Determine ownership of high-ranking spaces so that permission can be obtained as necessary
- Adopt special techniques when selecting poor-quality sites

How is available planting space estimated for planning purposes?

- Plantable space can be defined as a land area that is currently grassy, agricultural, or barren, and that has adequate space below and above ground for healthy tree development
- Two GIS-based methods exist (for details, contact the USDA FS Research Station in Syracuse)
    - Photo Interpretation
        - Use Digital Orthophoto Quadrangles or other digital aerial photography
        - Download and install the Random Point and Photo Interpretation extensions
        - Define the target domain (area considered for planting) inside the GIS
        - Drop random points inside the domain using the Random Point extension tool
        - Identify whether the area under the point is potentially plantable using the Photo Interpretation extension tool
        - Follow standard protocols for scaling up the results to yield a total estimate of plantable space
    - Land Cover Data Use
        - Obtain National Land Cover Dataset (NLCD 2001) files for the target area of planting
        - Use the "tree" and "impervious" layers to identify potential plantable space
        - Note that each pixel carries a value from 1 to 100 for each layer
        - Sum the "tree" and "impervious cover" values for each non-water pixel
        - Subtract that total from 100% to yield an estimate of plantable space
        - The resulting "plantable space" layer can be used to pinpoint areas to investigate
- Other estimation procedures exist, either manually working with photographs or using paper maps of different scales. For both, random selection procedures and ground verification are usually necessary.
- Ground survey is probably only practical for smaller domains

How can suitable sites actually be located?

- Larger planting spaces:
  - The most cost-effective spaces to pursue are open areas with room for multiple trees such as transportation corridors, parks, commercial landscapes, and institutional campuses
  - Public areas can be located through the appropriate agencies and their managers
  - Appeals could be made to owners of larger amounts of private land inside an urban area for contributions of planting sites, possibly with tax or other incentives
    - For example, "acres for ozone" could be sought
    - A target parcel size such as 4 acres would provide room for about 100 mature deciduous trees spaced 40ft-on-center
  - For such larger spaces, rural forestry practices that are not normally considered within an urban context may be applicable
- Smaller planting spaces:
  - Communities with good street and park tree inventory data and software can run reports on available space--*if* the inventory collected sites and not just trees
  - Online planting site information exists for a few large cities such as New York and Washington DC that could be utilized
  - The solicitation of single planting sites on private land is labor-intensive, and is probably best turned over to non-for-profit organizations (e.g., TreePeople, Trees Atlanta, Sacramento Tree Foundation or Tree Trust) with experience in that area

What criteria should be used for prioritizing sites?

- High ratios of tree spaces per site—such sites require the least amount of effort per tree and are consequently the most cost-effective to use
- Ownership—overall, public spaces will be easier to access, plant and manage
- Site quality—on sites with decent soil and drainage, the same cost and effort put into planting will tend to produce higher survival rates and greater canopy gain
- Community support--the most important urban site characteristic may be community good will
- Legality--potential sites must conform to criteria of the local city code or tree ordinance

How can ownership be determined and permission obtained?

- Parcel or tax maps display permanent reference numbers that link to current ownership
- Many larger communities have parcel maps in electronic form that can be used in a GIS
- Actual ownership is less important than perceived ownership on some urban sites, and research has shown that young tree survivorship is much higher when local residents are involved
- Volunteer organizations often have extensive experience obtaining permission from private individuals

What techniques will improve survival on poor-quality sites?

- Almost any site can support growth for some species of tree
- Inner-city sites are often the most challenging for tree survival, and special steps must be taken
- Sites composed primarily of urban rubble with a shallow layer of dirt are unlikely to support long-term tree growth unless techniques similar to those developed for restoration and reclamation can be used
- Sites with waterlogged soils can be planted with wetland reforestation methods
- Other difficult sites can be productive if species are carefully selected and planted

More information

- Good site selection guidelines can be found online such as those of the University Of Florida and RightTree/RightPlace
- Consult guidelines for species selection, which goes hand-in-hand with site selection

This factsheet was developed for the project "Building the Case for Urban Tree Canopy Cover Inclusion in State Implementation Plans," funded by USDA Forest Service, Urban and Community Forestry Program. See http://www.treescleanair.org/ for more information.